CLAIMS

1. A component mounting apparatus characterized by comprising:

a component conveying device (13) having a suction nozzle (5) for sucking and holding a component (1) to be placed on a circuit-formed member (2), for conveying the component sucked by the suction nozzle from a component sucking position (9) where the component is sucked by the suction nozzle to a component placing position (11) where the component sucked by the suction nozzle is placed on the circuit-formed member;

a component recognizing device (7) for recognizing the component sucked by the suction nozzle at a component recognizing position (10) existing on a path (12) on which the suction nozzle is moved by the component conveying device from the component sucking position to the component placing position; and

a control device (30) for determining a deviation (ΔL) of the component from a normal suction status (1b) on the suction nozzle on basis of component recognition information obtained by the component recognizing device, and for controlling a velocity of conveyance of the component in the component conveying device for a period of time following a recognition of the component and preceding

a placement of the component on basis of a magnitude of the deviation.

2. The component mounting apparatus as claimed in claim 1, wherein the control of the velocity of conveyance performed by the control device is a control by which a setting velocity set initially is decreased or retained for a determination of the velocity of conveyance.

3. The component mounting apparatus as claimed in claim 2, wherein the control device determines a force (Fm) which is caused in the component by the conveyance of the component at the setting velocity after the recognition of the component and tends to cause the component to deviate from a suction position of the component on the suction nozzle in the recognition of the component, on basis of the deviation, and controls the velocity of conveyance on basis of a result of comparison between the force tending to cause the component to deviate and a component holding force (F0) which the suction nozzle has.

4. The component mounting apparatus as claimed in claim 3, wherein the control device decreases the setting velocity to determine the velocity of conveyance when the deviation found on basis of the component recognition information is larger than a threshold value which is a magnitude of deviation based on the force tending to cause the component to deviate balanced with the component

holding force.

5. The component mounting apparatus as claimed in claim 3, wherein the control device comprises a component information storage section (30g) in which information on properties of the component held by the suction nozzle is stored, and controls the velocity of conveyance on basis of a result of comparison between the component holding force and the force tending to cause the component to deviate which is read from the component data storage section and varies with the properties of the component.

6. The component mounting apparatus as claimed in claim 4, wherein the control device comprises a component information storage section (30g) in which information on properties of the component held by the suction nozzle is stored, and controls the velocity of conveyance on basis of a result of comparison between the component holding force and the force tending to cause the component to deviate which is read from the component data storage section and varies with the properties of the component.

7. The component mounting apparatus as claimed in claim 3,

wherein the component conveying device comprises a plurality of suction nozzles of different types, and

wherein the control device comprises a storage section (30h) for suction nozzle in which information

representing a relation between types of the suction nozzles and the component holding forces is stored, and controls the velocity of conveyance on basis of a result of comparison between the component holding force of the suction nozzle sucking the component recognized by the component recognizing device, the force being read from the storage section for suction nozzle, and the force tending to cause the component to deviate which acts on the component sucked by the suction nozzle.

8. The component mounting apparatus as claimed in claim 4,

wherein the component conveying device comprises a plurality of suction nozzles of different types, and

wherein the control device comprises a storage section (30h) for suction nozzle in which information representing a relation between types of the suction nozzles and the component holding forces is stored, and controls the velocity of conveyance on basis of a result of comparison between the component holding force of the suction nozzle sucking the component recognized by the component recognizing device, the force being read from the storage section for suction nozzle, and the force tending to cause the component to deviate which acts on the component sucked by the suction nozzle.

9. The component mounting apparatus as claimed in

claim 5,

wherein the component conveying device comprises a plurality of suction nozzles of different types, and

wherein the control device comprises a storage section (30h) for suction nozzle in which information representing a relation between types of the suction nozzles and the component holding forces is stored, and controls the velocity of conveyance on basis of a result of comparison between the component holding force of the suction nozzle sucking the component recognized by the component recognizing device, the force being read from the storage section for suction nozzle, and the force tending to cause the component to deviate which acts on the component sucked by the suction nozzle.

10. A component mounting apparatus as claimed in claim 6,

wherein the component conveying device comprises a plurality of suction nozzles of different types, and

wherein the control device comprises a storage section (30h) for suction nozzle in which information representing a relation between types of the suction nozzles and the component holding forces is stored, and controls the velocity of conveyance on basis of a result of comparison between the component holding force of the suction nozzle sucking the component recognized by the

component recognizing device, the force being read from the storage section for suction nozzle, and the force tending to cause the component to deviate which acts on the component sucked by the suction nozzle.

11. A component mounting method in which a component (1) to be placed on a circuit-formed member (2) is sucked by a suction nozzle (5) and the component sucked by the suction nozzle is conveyed until being placed on the circuit-formed member, the method characterized by comprising:

recognizing the component sucked by the suction nozzle in a period of time following the suction of the component and preceding the placement of the component;

determining a deviation (ΔL) of the component from a normal suction status (1b) on the suction nozzle on basis of component recognition information obtained by the recognition of the component; and

controlling a velocity of conveyance of the component for a period of time following the recognition of the component and preceding the placement of the component on basis of a magnitude of the deviation.

12. The component mounting method as claimed in claim 11, wherein the control of the velocity of conveyance is a control by which a setting velocity set initially is decreased or retained for the determination of the velocity

of conveyance.

13. The component mounting method as claimed in claim 12, wherein the control of the velocity of conveyance based on the deviation is a control in which a force (Fm) caused in the component by the conveyance at the setting velocity after the recognition of the component and tending to cause the component to deviate from a suction position of the component on the suction nozzle in the recognition of the component is determined on basis of the deviation, and in which the velocity of conveyance is controlled on basis of a result of comparison between the force tending to cause the component to deviate and a component holding force (F0) which the suction nozzle has.

14. The component mounting method as claimed in claim 13, wherein the control of the velocity of conveyance based on the deviation is a control in which the setting velocity is decreased for the determination of the velocity of conveyance when the deviation found on basis of the component recognition information is larger than a threshold value which is a deviation based on the force tending to cause the component to deviate balanced with the component holding force.

15. The component mounting method as claimed in claim 13, wherein the control of the velocity of conveyance based on the deviation is a control in consideration of the force

tending to cause the component to deviate which varies with properties of the component.

16. The component mounting method as claimed in claim 14, wherein the control of the velocity of conveyance based on the deviation is a control in consideration of the force tending to cause the component to deviate which varies with properties of the component.

17. The component mounting method as claimed in claim 13, wherein on condition that a plurality of suction nozzles of different types exist, the control of the velocity of conveyance based on the deviation is a control in consideration of the component holding force which varies with types of the suction nozzles sucking the component.

18. The component mounting method as claimed in claim 14, wherein on condition that a plurality of suction nozzles of different types exist, the control of the velocity of conveyance based on the deviation is a control in consideration of the component holding force which varies with types of the suction nozzles sucking the component.

19. The component mounting method as claimed in claim 15, wherein on condition that a plurality of suction nozzles of different types exist, the control of the velocity of conveyance based on the deviation is a control

in consideration of the component holding force which varies with types of the suction nozzles sucking the component.

20. The component mounting method as claimed in claim 16, wherein on condition that a plurality of suction nozzles of different types exist, the control of the velocity of conveyance based on the deviation is a control in consideration of the component holding force which varies with types of the suction nozzles sucking the component.